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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,663	12/06/2001	Umang Anand	JHUKA1	8701
26663	7590	03/26/2004	EXAMINER	
LARRY J. GUFFEY			NGUYEN, DUNG V	
WORLD TRADE CENTER - SUITE 1800			ART UNIT	PAPER NUMBER
401 EAST PRATT STREET			3723	13
BALTIMORE, MD 21202			DATE MAILED: 03/26/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application N .</b>	<b>Applicant(s)</b>
	10/010,663	ANAND ET AL.
Examiner	Art Unit	
Dung V Nguyen	3723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### **Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 29 January 2004.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-52 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-3,5-12,14-16,18-25,27-29,31-38,40-42 and 44-51 is/are rejected.  
7)  Claim(s) 4,13,17,26,30,39,43 and 52 is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a))

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date .  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 14-16 and 18-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Katz (USPN 5,921,846). Katz discloses a method for reducing erosion on the inner wall of a cutting jet mixing tube due to a fluid jet with entrained abrasive particles flowing from the tube's inlet port, along the tube's wall and exiting through the tube's outlet port comprising the steps of forming a mixing tube 7 so that at least a portion of its wall is porous, surrounding at least a portion of the outer wall of the mixing tube wall with a lubricating fluid reservoir 6 and forcing lubricating fluid to pass from the lubricating reservoir 6 and through the porous wall to form a lubricating film between the mixing tube wall and the flow of abrasive fluid, wherein the smallest cross sectional dimension of the passage connecting the mixing tube inlet and outlet ports is 500 microns, wherein the abrasive particles have an average diameter of less than half of the smallest cross sectional dimension of the passage connecting the mixing tube inlet and outlet ports, wherein the lubricating fluid having a kinematic viscosity whose ratio with the kinematic viscosity of the jet's carrier fluid is 40/1, wherein ratio of flow rate of lubricating fluid and flow rate of fluid jet and entrained abrasive is 0.1% or 1/1000, wherein the thickness of the mixing tube wall is varied along its length to control the flow

rate of the lubricating fluid, wherein the mixing tube wall have variable porosity along its length to control the flow rate of the lubricating fluid, wherein the porous mixing tube being fabricated from a porous ceramic material, porous metal, sintered porous material and made by a molding process (note Fig. 1A-1C, col. 2, line 45 to col. 5, line 21).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-12, 27-29, 31-38, 40-42 and 44-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz (USPN 5,921,846) in view of Applicant's Admitted Prior Art (AAPA). Katz discloses an abrasive, fluid cutting apparatus comprising a chamber 2 having an inlet for receiving a pressurized fluid jet, and an exit through which the fluid jet and entrained abrasive exit the chamber 10, a mixing tube 7 having an entry port for receiving the fluid jet and entrained abrasives, an inner wall for directing the flow of the fluid jet and entrained abrasives, and an outlet port 9 through which the fluid jet and entrained abrasives exit the tube 7, wherein the tube entry port is proximate the chamber exit, a lubricating fluid reservoir 6 that surrounds at least a portion of an outer wall of the mixing tube 7, wherein at least a portion of the mixing tube wall being porous, wherein the lubricating fluid passes from the lubricating reservoir 6 and through the porous wall to lubricating at least a portion of the surface of the mixing tube wall so as to resist erosion of the tube wall while the fluid jet and

entrained abrasives flow through the mixing tube 7, wherein the smallest cross sectional dimension of the passage connecting the mixing tube inlet and outlet ports is 500 microns, wherein the abrasive particles have an average diameter of less than half of the smallest cross sectional dimension of the passage connecting the mixing tube inlet and outlet ports, wherein the lubricating fluid having a kinematic viscosity whose ratio with the kinematic viscosity of the jet's carrier fluid is 40/1, wherein ratio of flow rate of lubricating fluid and flow rate of fluid jet and entrained abrasive is 0.1% or 1/1000, wherein the thickness of the mixing tube wall is varied along its length to control the flow rate of the lubricating fluid, wherein the mixing tube wall have variable porosity along its length to control the flow rate of the lubricating fluid, wherein the porous mixing tube being fabricated from a porous ceramic material, porous metal, sintered porous material and made by a molding process (note Fig. 1A-1C, col. 2, line 45 to col. 5, line 21). Katz does not disclose a chamber having a separate port for receiving a flow of abrasive particles. AAPA, in Fig. 2 and at page 2, lines 19-26 of applicant's specification, disclose a chamber having an inlet for receiving a pressurized fluid jet, a port for receiving a flow of abrasive particles which are entrained into the fluid jet, and an exit through which the fluid jet and entrained abrasive exit the chamber. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a chamber having a separate port for mixing abrasive particles with the pressurized fluid jet in the mixing chamber.

5. Claims 1-3, 5-12, 27-29, 31-38, 40-42 and 44-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz (USPN 5,921,846) in view of Hashish et al

(USPN 4,648,215). Katz discloses the claimed invention as described above, however, Katz does not disclose a chamber having a port for receiving a flow of abrasive particles. Hashish et al disclose a chamber having a port 42 receiving a flow of abrasive particles (note Fig. 5, col. 4, lines 22-58). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the chamber of Katz with a chamber disclosed by Hashish et al having separate port for receiving a flow of abrasive particles in order to entrained abrasive particles into the pressurized fluid jet in the mixing chamber.

***Allowable Subject Matter***

6. Claims 4, 13, 17, 26, 30, 39, 43 and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-3, 5-12, 14-16, 18-25, 27-29, 31-38, 40-42 and 44-51 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yie, Kiyoshige et al and Hashish '289 are cited to show abrasive water jet cutting apparatus.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung V Nguyen whose telephone number is 703-305-0036. The examiner can normally be reached on M-F, 6:30-3:00.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J Hail can be reached on 703-308-2687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DVN  
March 22, 2004

  
**DUNG VAN NGUYEN**  
**PRIMARY EXAMINER**